

# **University research in the global environment, the challenges of the science technology policies in Latin America 1990-2007**

**Germán Sánchez Daza  
Helder Osorio Moranchel<sup>♦</sup>**

## **Abstract**

The main aim of this research is analyze how have been modified research activities in the Latin American Universities, considering foreign pressures of the globalization and the science and technology policies implemented in Latin America; thus we try to identify the strategies and advances reached by universities in relation to this policies. It is necessary to know in Latin America the main institutions of research are the universities.

## **Background and methods**

In the eighties, several authors and organizations had established the way of the organization and the public policy in science and technology started to change. About this, OECD talks about a change in the organizational model, the transition from one based in disciplines and scientific curiosity to another focused on multidisciplinary institutional networks and its aim is resolve problems. This phenomenon has been theorized by Stokes in his “quadrants” of the scientific research, basic research is only inspired from its use. Another author, Gibbons in the module 2 of production of knowledge says the problems should be posed and solved in the context of the application, this is more complex and it concern to a field even more transdisciplinary and involve more transitory ways of organization, besides the quality control is delimited by the social responsibility. It is about substantial modifications within the science and technological systems of different countries, inside each institution and actors that participate in them; even more public, private and social institutions, researchers, business men, government officials and social actors in general.

According to M. Albornoz (2001), there are at least four different positions about policies. The first one, “traditional scientific” based on knowledge supply; its main axis is resources allocation to enhance basic research, and this model prevails in most of the scientific community in Latin America. The second position is innovation systems based on knowledge demand; the axis for the collaboration in public policies revolve around stimulate innovative behavior of the firms. The third focuses on information society, it takes advantage of internet potentiality and its supposed universal availability of knowledge. This policy stresses on enhance information and telecommunications infrastructure; but on the other hand, it relegates the possibility to create any endogenous scientific capacity since it considers a new international distribution of work and knowledge in response to global tendencies. Finally, the fourth promotes capacities in sciences and technology, and it stands out the necessity to implement policies consider not only research and development but different stages or modalities of social process of knowledge.

In this context, Arocena and Sutz (2001), considering the global environment, economic and social, analyze tendencies and perspectives of the universities in Latin America and

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<sup>♦</sup> Researchers of Benemerita Universidad Autonoma de Puebla (BUAP) Mexico, Faculty of Economics, e-mails: sdaza@siu.buap.mx and helderom@eco.buap.mx

they conclude that these institutions go by a joint with strong uncertainty that implies important decisions to promote sustainable development in the region; without forget the importance of universities in the economic and social working at the present time.

Lastly, Vessuri (2000) recognizes that despite of several political reforms in the last decade, these have not achieved a deep level of transformation to strengthen and develop university research.

According to this we analyze the official plans and programs about research and technology in the Latin-American countries, as well as the indicators about this topic. This is a documental research.

#### Preliminary Results

In the modern sense, scientific-technological research in Latin America started in the late 19<sup>th</sup> century, from then on we can identify five stages (Vessuri, 1996):

- ❖ Emergence, research was linked with positivist European program;
- ❖ Incipient institutionalization of experimental science (1918-1940)
- ❖ Two decades of development (1940-1960), institutionalization of research, emergence of large centers and institutions
- ❖ Emergence of the scientific policy (1960-1980) the technological dependence increases.
- ❖ “The fifth stage”, emergence of “new public” for the science: the industry (1980-1990; competitiveness and innovation are the main issues.

During these stages it was shaped a system of research and it was developed a management that defined strategies and policies in science and technology. The universities were the place where research took root and was developed in “the natural way”; and it was addressed on *general* scientific criteria and not on social and economic requirements.

Under Washington Consensus’ policies World Bank, Inter-American Development Bank and Organization of American States established new diagnosis and financing policies. This way, in the nineties we can see substantial modifications, inspired in this view, in all science and technological systems in Latin America. These policies and institutional changes are a major linking with the productive sector; implementation of new efficiency and quality criteria in research-related activities; re-orientation of the kind of research (emphasis on applied one); promotion of self-governed research centers according to market criteria; ways of financing (creation of specific budgets for innovation and linking); and creation of business incubators, scientific parks and university centers of linking.

On the other hand, Vessuri (1996) stand out another changes in university research; evaluation systems of quality and productiveness, incentives and linking programs, innovation and technological development, establishment of profitability criteria or/and relevancy of the research.

The reactions to these policies and theirs consequences had been different; depend on country characteristics and on each institution; but we can observe there is still a discussion about the strategies that universities should be elaborate and implement. Then, the aim of this research is precisely to analyze fifth-stage strategies, and make a typology of the responds to the science and technology policies based on demand.